Midterm Exam

CMSY-199, Spring 2011

Section 1. Answer True or False to each of the following statements:

_____ 1. If the number of loop iterations is *not* known in advance, it is best to use sentinel-controlled repetition.

_____ 2. The Java repetition statements include `if`, `if..else`, and `switch`.

_____ 3. The `break` and `goto` statements can be used to alter the flow of execution inside a repetition statement.

_____ 4. The conditional OR operator (`||`) has lower precedence than the conditional AND operator (`&&`).

_____ 5. A `static` method may be called without creating an instance of a class.

_____ 6. Methods which have the same name but different signatures are said to be overloaded.

_____ 7. The number of elements in an array is stored in its `length` field while the number of elements in an `ArrayList` can be retrieved with a call to the `size()` method.

_____ 8. When an array is created with the `new` keyword, its elements are *not* initialized automatically.

_____ 9. The `ArrayList` class can automatically change size at runtime to accomodate additional elements.

_____ 10. The `ArrayList` class is *not* a member of the Java Collections Framework.

Section 2. Circle the letter of the best answer for each question:
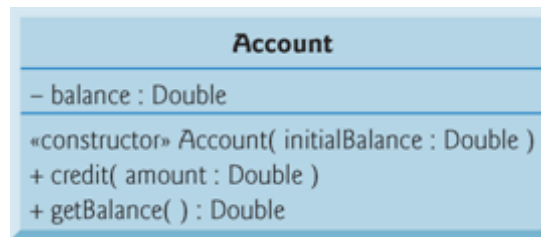
11. What symbol is used to indicate a variable-length argument list?

    (a) underscore

    (b) backslash

    (c) ellipsis

    (d) caret

12. Which of the following is *not* a valid Java identifer?

    (a) `7wonders`

    (b) `SEVEN_WONDERS`

    (c) `sevenWonders`

    (d) `SevenWonders`

13. Which of the following obeys the standard Java naming conventions for an instance vaiable name?

    (a) `SomeClass`

    (b) `SOME_CLASS`

    (c) `someClass`

    (d) `someclass`

14. The command-line arguments for a Java application are stored in an array called `args`. What is stored in the element `args[0]`?

    (a) The first command-line argument

    (b) The number of command-line arguments

    (c) The name of the Java application

    (d) The version number of the JVM

15. What character encoding set does Java use to represent characters?

    (a) ASCII

    (b) EBCDIC

    (c) Unicode

    (d) UTF-8

16. Which of the following Java keywords is used to identify constants?

    (a) `const`

    (b) `final`

    (c) `immutable`

    (d) `parameter`

17. Which of the following is the default primtive floaing point type in Java?

    (a) `real`

    (b) `float`

    (c) `decimal`

    (d) `double`

18. What is true about Java regular expressions?

    (a) The `\w` metacharacter searches for any character.

    (b) The `\d` metacharacter searches for word characters.

    (c) The `.` metacharacter searches only for decimal digits.

    (d) The String `[a-f]` searches for `a`, `b`, `c`, `d`, `e`, or `f`, characters.

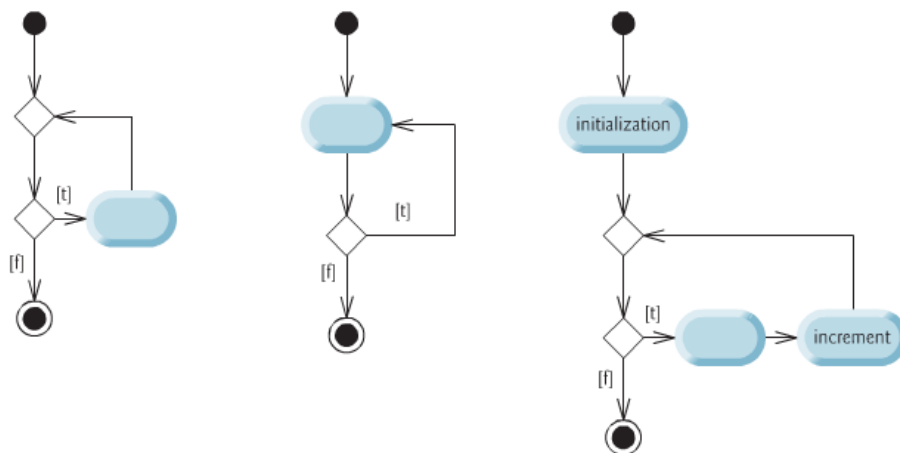19. Which of the following is *not* an exception thrown by the JVM?

   (a)   `NextWithoutForException`

   (b)   `NullPointerException`

   (c)   `ArrayIndexOutOfBoundsException`

   (d)   `ClassNotFoundException`

20. What Java access modifier should be used for the method `getBalance` in the UML diagram shown below?

   (a)   `public`

   (b)   `private`

   (c)   `protected`

   (d)   no modifier is needed - default or package access

21. Which Java control statement is *not* represented as one of the three UML diagrams shown below?

   (a)   `for`

   (b)   `switch`

   (c)   `while`

   (d)   `do...while`

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Section 3.   Answer the following questions:

22. Given the following three-argument constructor, write a Java statement to create an instance of the `Employee` class called `oracleChief` for an employee whose name is Larry Ellison and has an annual salary of 84.5 million dollars.

```
public Employee(String first, String last, double pay)
{
   firstName = first;
   lastName = last;
   salary = pay;
}
```

23. The `determineLargest` method takes a ten-element integer array and returns the largest integer in that array. Write the Java code to implement this method.

```
public int determineLargest(int number[])
{




}
```

24. Using the static `min` method from the `Math` class, write a single Java statement which assigns the smallest of three integer variables - `a`, `b`, and `c` - to an integer variable named `minimum`.

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25. What output is produced by the following Java code segment?

```
for (int i=1; i <= 4; i++)
{
   for (int j=1; j <= i; j++)
      System.out.print("*");
   System.out.println();
}
```

26. Complete the `TrafficLight` class by writing a `switch` statement that prints the appropriate action to take based on the color of the traffic light.

```
public class TrafficLight
{
   private enum Color {RED, YELLOW, GREEN};

   public void printAction(Color lightColor)
   {
      switch(                    )
      {




         }




   }


}
```

Section 4. Circle the letter of the best answer for each question:

27. What is the output when the following Java application is run?

```
public class Dog
{
   private String name;

   public static void main(String args[])
   {
      Dog myDog = new Dog();
      myDog.name = "Achilles";
      int age = 4;

      changeDog(myDog, age);
      System.out.println(myDog.name + "   " + age);
   }

   private static void changeDog(Dog dog, int age)
   {
      dog.name = "Chloe";
      age = 3;
   }
}
```

   (a)   Achilles 3
   (b)   Achilles 4
   (c)   Chloe 3
   (d)   Chloe 4

28. What is the output if you compile and execute the following Java application?

```
public class BeeKeeper
{
   public static void main(String args[])
   {
      String d = "beekeeper";
      d.substring(1,7);
      d = "w" + d;
      d.insert(3,"bee");
      System.out.println(d);
   }
}
```

   (a)   weebeekeep
   (b)   wbeekeeper
   (c)   Compilation fails.
   (d)   An exception is thrown at runtime.

29. Consider the following code segment.

```
int k = 2;
while (true)
{
   ++k;
   int j = 6;
   k = 9 - j;
   if (j++ == 3)
      continue;
   else
      break;
}
System.out.println(k);
```

What is printed as a result of executing the code segment?

(a)   2

(b)   3

(c)   6

(d)   7

30. What is the output if you compile and run the following Java application with the command `java Vark we rule`?

```
public class Vark
{
   public static void main(String args[])
   {
      Vark v = new Vark();
      v.go(args,42);
   }

   private void go(String a[], int life)
   {
      System.out.println(a[1]);

   }
}
```

(a)   we

(b)   rule

(c)   Compilation fails.

(d)   An exception is thrown at runtime.

31. What is the output if you compile and run the following Java application?

```
public class ForLoop
{
   public static void main(String args[])
   {
      int x = 2;
      int y;
      for (y=2; y > 0; y--)
      {
         System.out.print(x + " " + y + " ");
         x++;
      }
      System.out.print(x + " " + y + " ");
   }
}
```

(a)   2 1 3 0

(b)   2 2 3 1 4 0

(c)   Compilation fails.

(d)   An exception is thrown at runtime.

32. Consider the following code segment.

```
for (int k = 0; k < 20; k = k + 2)
{
   if (k % 3 == 1)
   System.out.print(k + " ");
}
```

What is printed as a result of executing the code segment?

(a)   4 16

(b)   4 10 16

(c)   0 6 12 18

(d)   1 4 7 10 13 16 19

(e)   0 2 4 6 8 10 12 14 16 18

33. Consider the following code segment.

```
ArrayList<String> list = new ArrayList<String>();

list.add("P");
list.add("Q");
list.add("R");
list.set(2, "s");
list.add(2, "T");
list.add("u");
System.out.println(list);
```

What is printed as a result of executing the code segment?

(a)   [P, Q, R, s, T]

(b)   [P, Q, s, T, u]

(c)   [P, Q, T, s, u]

(d)   [P, T, Q, s, u]

(e)   [P, T, s, R, u]

Section 5.   Fill in the blanks in each of the following statements:

34. There are two aspects to learning Java - the _____ itself and the classes in the _____.

35. In order to read keyboard input from the user in a Java program, you should import the _____ class from the _____ package.

36. An error which violates the rules of the Java language and prevents compilation is called a _____ error while an error that produces an incorrect result during runtime is a _____ error.

37. In order to create an instance of a class, you must use the _____ keyword and make a call to the _____.

38. Java has two fundamental data types - the _____ type and the _____ type.

39. The members of a class consist of its _____ and _____.

40. When writing a GUI application, you often need to import classes from the java._____ and the javax._____ packages.